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REMARKS

The present remarks are in response to the Office Action of April19, 2007. Claims 36-39, 41, 43, and 45-47 are currently being considered in the present application. Claims 1-35, 40, 42, 44, and 48-65 were with withdrawn subject to restriction/election requirements. Reconsideration of the application is respectfully requested in view of the following responsive remarks.

In the Office Action of April 19, 2007, the following actions were taken:

(1) Claims 36-39, 43, 45 and 46 were rejected under 35 U.S.C. 102(a) as being anticipated by, or in the alternative, 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 2002/0198287 to Ohta et al. (hereinafter "Ohta"); and

It is respectfully requested that the presently pending claims be reconsidered and allowed.

The Examiner has again upheld rejections of claims 36-39, 43, and 45-47 under 35 U.S.C. 102 and 35 U.S.C. 103 over Ohta. The Applicants maintain that the presently claimed compositions are distinct from those taught in Ohta. Applicants understand and continue to acknowledge that patentability in product-by-process claims is based on the end product itself and not the process used to make the product. However, it is noted that patentability can be demonstrated by describing a product by a process which inherently yields a product which is unique and patentable over the cited art. In the instant case, although the process alone is insufficient to impart patentability, the process is relevant to the patentability of the present invention insofar as it demonstrates that the resulting product is unique as compared to the compositions of the cited reference.

As stated in the previous office action responses, the Applicant reasserts that the compositions taught in Ohta do not teach the same composition as that currently claimed. Evidence of this is taken from the differences in processing, which necessarily produces different compositions. Therefore, the composition of Ohta can not be the same as the claimed composition by virtue of the fact that the presently claimed process in fact

yields different products than those processes disclosed in the cited reference. The reasoning and technical explanation of the differences is discussed below.

The present invention teaches a latex-containing ink-jet ink, which includes a liquid vehicle, a colorant that is dissolved or dispersed in the vehicle, latex particulates that are dispersed in the liquid vehicle, and released blocking groups. The Applicant again acknowledges that, in the case of product by process claims, the product is being claimed, not the process. That being said, the process recited in claim 36 creates inherently distinctive latex particulates which, when incorporated into an ink-jet ink, yields an inherently distinct ink. The latex particulates of the present invention are formed by a specific process, which requires the preparation of a monomer emulsion that includes an aqueous phase and an organic monomer (dispersed or co-dispersed in the aqueous phase) including at least one blocked acid monomer. In other words, the polymerization (or copolymerization) of the blocked acid monomer occurs within the discontinuous phase of the aqueous emulsion. After polymerization of the organic monomer(s), which includes at least one blocked acid monomer, blocked acid latex particulates dispersed within the aqueous phase are formed. The blocked acid latex particulates are then unblocked to form acidified latex particulates that are suspended in the aqueous phase, and the aqueous phase forms at least part of the liquid vehicle of the ink-jet ink.

The process of forming the latex particulates of the present invention results in latex particulates which are chemically and physically unique from the latexes formed using the methods taught in Ohta.

One of the unique characteristics of the latex particulates of the present invention is the presence of blocked acid groups in the core of the latex particulate. This affect is a result of the process by which the latex particulate. As recited in pending claim 36, the process of manufacture for the latex particulate begins with monomers containing blocked acid groups. These monomers are polymerized to form blocked acid latex particulates and then the blocked acid latex particulates are unblocked. As would be well understood by one of ordinary skill in the art, unblocking the blocked acid

groups after the formation of the particulates allows for unblocking of primarily those blocked acid groups which are at least partially exposed on the surface of the latex particulate. Unblocking reactions of the blocked acid groups which are in the core of the latex particulate would be sterically hindered by the outer portions of the particulate and thus not be able to occur. Hence, the latex particulates of the present invention inherently (based on their process of manufacture) include some blocked acid groups in their core.

In contrast, an examination of the processes used in Ohta show clearly that the reference does not teach the actual latex claimed in the present invention. As discussed in previous responses, Ohta teaches that the sulfonated latex particles used in its ink can be made in two different ways. First, the sulfonated dispersibility-imparting group can be part of the monomer structure of the constituent resin and then polymerized. Second, the base polymer or skeletal backbone of styrene-(meth)acrylic acid is made without the sulfur containing dispersibility-group. Then the already polymerized styrene copolymer can be altered so that the dispersibility–imparting group is grafted to the skeletal backbone of the styrene copolymer. In other words, the monomers are polymerized together first and then a sulfur containing group is grafted afterward. See Paragraph 59 of the Ohta specification. Neither process teaches the process as claimed to form the latex particulates. Specifically, Ohta does not teach the use of blocking groups, and therefore does teach latex particulates which have some blocked acid groups in their core. In other words, since Ohta never blocks its strong acid groups, it cannot have residual blocked acid groups that remain in the core.

Another distinction between the latex particulates of the present invention and those taught in Ohta is that the process of the present invention results in a latex particulate with more incorporated acid groups in the particle then the process discussed in Ohta. It is also generally known in the art that latex particulate surface charge is typically created through emulsion polymerization of an acid monomer, with or without other monomers, to form latex particulates. Such acid monomers should be sufficiently hydrophobic to substantially remain in the organic phase of the emulsion that forms the particles. Because strong acid groups, such as those taught and used in

Ohta, are strongly water soluble and tend to migrate quickly out of the organic phase, effective polymer design has been generally limited to relatively weak organic acids, typically carboxylic acids, having correspondingly low ionization. When stronger acids are used, they even more readily migrate out of the hydrophobic phase and into the aqueous phase. Thus, the concentration of the strong acid on the surface suffers. In other words, when strong acid monomers are used in the manufacture of latex particulates, the degree of their incorporation into the particulate is generally very limited due to the reaction kinetics. Additionally, the strong acid monomers form detrimental water-soluble and ion-bearing polymers when they migrate out of the organic phase and into the water phase. The resultant increase in the ionic strength of the aqueous phase of the latex dispersion reduces the effect of the charge surrounding each particle, weakening particle dispersion stability. This is why the process of manufacturing the latex is so important, and why the process of manufacture affects the final compositional properties.

As discussed above, the manufacturing process for the latex particulates of the present invention involves the polymerization of blocked acid containing monomers and then unblocking the blocked acid after polymerization is complete. By virtue of this process, the particulates of the present invention have a high degree of incorporation of the acid groups because the blocked acid groups do not migrate into the aqueous phase. Because the blocked acid groups do not as readily migrate into the aqueous phase, they are present in higher concentrations in the organic phase (greater than if the monomers had unblocked strong acid groups), thus facilitating their incorporation into the latex particulates.

As described above, the sulfur containing polymer latex used in Ohta can be manufactured in two ways. The first method of incorporating sulfur containing dispersibility-groups involves polymerizing monomers which already have sulfur containing groups attached thereto. The monomers are polymerized together using emulsion polymerization to yield a copolymer having sulfur containing groups at least on the surface. As mentioned previously, this type of polymerization is problematic in that the strong acid or sulfur containing monomers have the tendency to migrate out of the organic

phase and into the water phase prior to polymerization because of their high solubility. Another known problem with this type of polymerization is that the strong acid groups interfere with the polymerization reaction. Such interference results in lower degrees of polymerization.

In contrast to the monomers taught in Ohta, the blocked acid monomers used in the manufacture of the latex particulates of the present invention do not interfere with the polymerization. Because the strong acid groups are blocked in the monomers of the present invention, they do not interfere with the polymerization resulting in different, compositionally distinct particulates.

For each of the reasons discussed above, the latex particulates of the present invention are unique from the latex particulates taught in Ohta. As such, the ink-jet ink compositions of the present invention are unique and patentable over Ohta. Therefore, it is respectfully requested that the Examiner withdraw the present rejections and allow each of the pending claims.

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CONCLUSION

In view of the foregoing, Applicant believes that claims 36-39, 43, and 45-47 present allowable subject matter and allowance is respectfully requested. It is also submitted that at least claim 40 be rejoined upon allowance of claim 36. If any impediment to the allowance of these claims remains after consideration of the above remarks, and such impediment could be removed during a telephone interview, the Examiner is invited to the undersigned attorney so that such issues may be resolved as expeditiously as possible.

Please charge any additional fees except for Issue Fee or credit any overpayment to Deposit Account No. 08-2025

Dated this the 17th day of July, 2007.

Respectfully submitted,

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